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Francisco José Sáez-Martínez, Elena Jiménez, Gilles Lefebvre and Matthias Beekmann

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Francisco José Sáez-Martínez, Elena Jiménez Martínez,

Gilles Lefebvre and Matthias Beekmann

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2016

RE: Renewable Energy

RE-01 "RENEWABLE ENERGY APPLIED TO THE MOBILITY SECTOR. BOUND4BLUE CONCEPT TO GENERATE HYDROGEN AND OXYGEN".
Aleixendri, C.; Bermúdez, J.M.; Ferrer, D.; Fúnez, C. and Reyes-Bozo, L.

RE-02 "THE USE OF MINE WATER IN GEOTHERMAL ENERGY SYSTEMS: A CASE STUDY IN ASTURIAS"
Covadonga Loredo, N. Roqueñí , F.J. De Cos, C. Crespo

RE-03 "A SIMPLE MODEL FOR ESTIMATION OF FUEL INJECTION RATE WITH A SOLENOID OPERATED INJECTOR".
Mata, C.; Martínez, S.; Avila, C. and Calvo-Parra, D.

SeM: Science and Engineering of Eco-Materials

SeM-01 "NATURAL FIBERS: CHARACTERIZATION AND APPLICATIONS OF BIOBASED MATERIALS".
Dujardin, N.

SeM-02 "EXPERIMENTAL STUDY OF HYGROTHERMAL PROPERTIES OF DATE PALM CONCRETE"
Haba, B; Chennouf, N.; Boudenne, A. and Agoudjil, B

SM: Science and Engineering of Materials

SM-01 "HIGH-PRESSURE PHASE EQUILIBRIUM OF THE TERNARY SYSTEM CO2/ETHYL ACETATE/PLGA"
Álvarez, L., López, A., Gutiérrez, C., Rodríguez, J. F., de Lucas, A, García, M. T.

SM-02 "RISK MINIMIZING OF SILICA NANOPARTICLES BY PRODUCING MICRON-SIZED GRANULES USING SPRAY-DRYING"
J. Martin-Campo, A. Serrano, C. Gutiérrez, A. Borreguero, J.F. Rodríguez , M. Carmona

SM-03 "PRODUCTION OF HYDROPHOBIC CONCRETE BY USING A RELEASE AGENT BASED ON NANOPARTICLES"
I.Izarra, A.Gálvez, J.Cubillo, J.F. Rodríguez, M. Carmona

SM-04 "NEW COMPOSITES MCPS BASED MINERAL POWDER FOR THERMAL STORAGE OF HEAT ENERGY"
Khedache S., Makhlouf S., Djefel D., Lefebvre G., Royon L.

SH: Smart Heterogeneous Energy Systems

SH-01 "SMART METERS IN SMART MANUFACTURING".
Martín, I.; Florence, A.; González, E. and Andina, D.

	• "CRUDE GLYCEROL FROM BIODIESEL AS SUSTAINABLE GLYCOLYSIS AGENT FOR POLYURETHANE WASTE". Simon, D.; De Lucas, A.; Rodríguez, J.F. and Borreguero, A.M. • "LIFE CYCLE ASSESSMENT APPLIED TO URBAN PROJECTS". Peuportier, B.; Roux, C. and Schalbart, P. • "POPEM: Coupling population dynamics with Earth System Models". Navarro, A.; Tapiador, F.J.; Jiménez-Alcázar, A. and Moreno, R.

20:00 – 22:30 GALA DINNER

29th October

-Parallel Sessions 5-

08:30 – 10:15

Amphi 101	**Parallel Session 5A - Sustainability and Water (I) & Groundwater Management in Arid and Semiarid Regions. Chair: Ahmed Murad (UAEU)** • "NEW APPROACHES FOR THE IONIC LIQUID TREATMENT UNDER ADVANCED OXIDATION PROCESSES". Díez, A.M.; Sanromán, M.A and Pazos, M.M. • "HETEROGENEOUS ELECTRO-FENTON CATALYST FOR IONIC LIQUID DEGRADATION". Sanromán, M.A.; Meijide, J. and Pazos, M.M. • "SPECTROPHOTOMETRIC DETERMINATION OF NITRATE IN HIGH SALINE WATER: EFECT OF MASKING AGENTS". Valiente, N.; Jirsa, F. and Gómez-Alday J.J. • "PESTICIDE POLLUTION IN GROUNDWATER BODIES IN THE JUCAR RIVER BASIN (SE SPAIN)". Menchén, A. and Gómez-Alday, J.J. • "EVALUATION OF THE AQUIFER RECHARGE BY INFILTRATION TESTS IN ARID REGION: A CASE STUDY ON WADI AL BIH DAM, RAS AL KHAIMAH, NORTHERN EMIRATES, UNITED ARAB EMIRATES (UAE)". Murad, A.; Mahmoud, S.; Arman, H.; Gabr, A. and Al Dhuhoori, A.
Salle 301	**Parallel Session 5B - Solar Energy, Wind Energy & Smart Heterogeneous Energy Systems. Chair: Irene Martín (UPM)** • "SOLAR RADIATION VARIABILITY AND IMPLICATIONS IN ELECTRICITY GENERATION: SATELLITE DATA ANALYSIS FOR THE IBERIAN PENINSULA". Gutiérrez, C.; Gaertner, M.A.; Gallardo, C.; Perpiñan, O and Gil, V. • "UV ACCELERATED AGEING TEST ON UN-PACKAGED MONOCRYSTALLINE SILICON SOLAR CELLS". Guiheneuf, V.; Delaleux, F.; Riou, O.; Logerais, P.O. and Durastanti, J.F. • "A FREQUENCY ANALYSIS BASED PREDICTIVE MAINTENANCE APPROACH FOR DRIVING MECHANISMS IN WIND TURBINES". Ruiz, R.; Lang, Z.Q. and García, F.P. • "SCENARIO GENERATION FOR WEIBULL-DISTRIBUTED AND EXPONENTIALLY-AUTOCORRELATED WIND SPEED". Zárate-Miñano,R. and Carrión, M. • "SMART METERS IN SMART MANUFACTURING". Martín, I.; Florence, A.; González, E. and Andina, D.

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SMART METERS IN SMART MANUFACURING.

Martin Rubio, I.[1] Florence Sandoval, A. [1], González Sánchez, E. [1,2] and Andina, D.[3]

[1]Organizational Engineering Dept.,
Technical University of Madrid, Ronda de Valencia, 3 28012 Madrid, Spain
[2]ANESE (Energy Services Companys Association)
[3,2]Signals, Systems and Communications Dpt.,
Technical University of Madrid, Moncloa Campus

E-mail: irene.mrubio@upm.es

SMART METERS IN SMART MANUFACURING.

1. Purpose

The extent of change in business process and smart manufacturing as a result of smart metering usage should be taken into account in every energy efficiency project in industries. A significant part of smart metering success depends upon making the business processes more systematic. Smart manufacturing is the dramatically intensified and pervasive application of networked information-based technologies through the manufacturing and supply chain enterprise.

There is no doubt that the deployment of smart meters involves complex and different business models, the management of significant risks, and the need for research and development of new technologies, business models and organization engineering. Industrial energy audits play an important role in achieving cost optimization and peak load reduction goals for industry. In this paper, we present the impact of smart meters on industry. In essence, smarts meters promotes the (r)evolution of smart manufacturing.

2. Approach

Smart Meter Systems are an integral part of the Smart Grid infrastructure (See figure 2) in data collection and communications. The Smart Grid is essentially the modernization of the transmission and distribution aspects of the electrical grid. Smart Grids are interconnected networks for delivering electricity that use Information and Communications Technologies (ICTs) to process information about the behaviours of suppliers and consumers, improving the efficiency, reliability, economics, and sustainability of the production and distribution The smart grid embodies the intersection of power engineering and information technology. The Smart Grid is essentially the modernization of the transmission and distribution aspects of the electrical Grid. It changes the relationships among electricity suppliers and manufacturing firms, promoting the (r) evolution of smart manufacturing. Three main business segments for smart grid technologies: customer applications, Advanced Metering Infrastructure (AMI)/smart meters, and grid applications.

Smart Manufacturing responds and leads to a dramatic and fundamental business transformation to demand-dynamic economics. Smart factories and supply networks can revitalize the industrial sector and facilitating manufacturing innovation. Smart Manufacturing envisions the enterprise that integrates the intelligence of the customer, its partner and society.

3. Results/Findings

Business processes are characterized by three elements: the inputs, (data such customer inquiries or materials), the processing of the data or materials (which usually go through several stages and may necessary stops that turns out to be time and money consuming), and the outcome (the delivery of the expected result). The use of smart meters in industries would require three different classes of transformation, i.e. changes in infrastructure, addition of monitoring and

analysis layer and modifications in business processes. Therefore it is essential to first understand different layers of smart metering infrastructure (applications, communications and power layer) and identify the business, financial and technical requirements that are to be satisfied by this infrastructure. Systems goals, systems architecture and protocols of interactions of different systems components, system constrains and identifications of risks should be carefully defined and designed. Systems of Systems Engineering paradigm has evolved as a popular choice for being an economic and strategic approach for enhancing existing system capabilities and developing new ones.

Energy auditing is a key process: the process of assessing the energy efficiency of a system and identifying ways in which it can be improved Industrial energy audits play an important role in achieving cost optimization and peak load reduction goals for industry and utility, respectively. These audits can become much more effective if greater details about consumption breakdown and user behaviour are known. Smart meters offer varying levels of granular data that can precisely reveal the energy consumption trends, hence allowing effective audits. Demad response (DR) is broadly understood as the modifications in electrical energy consumption pattern of a consumer in view of some incentive, pricing effect or even a signal from utility. Energy efficiency and demand response are different in nature and objectives. Energy efficiency programs aim to decrease the consumer energy usage on permanent basis by the installation of energy efficient technologies whereas demand response is a series of steps that reduce electric loads in case of grid failure, peak demand or nay other emergency.

Building a culture that encourages rich dialog and compelling solutions across these competencies is difficult but required in order to success. Few companies can or should develop the full suite of capabilities in-house. The ability to identify, convene and manage partnerships, alliances and more informal consortia is growing in importance.

4. Conclusions

The benefits of Smart Metering installations are numerous for many stakeholder from customers to transmission suppliers and distribution companies: better transformer load management, better access and data to manage energy use, power quality data, reduced back office rebilling etc. To succeed in today's environment, new business models are needed, as well as changes in business architecture, protocols, rights and pricing terms to facilitate emerging process enabled by new technologies. Companies can not accomplish alone their goals, organizations integrate the intelligence of customers, partners, and public through their manufacturing supply chain.

Smart meters promotes smart manufacturing as a new enterprise operating model in which demand-dynamic economics, active performance-driven management, and broad-based innovation are achieved by using technology to distribute business intelligence and energy efficiency intelligence through the enterprise. Greater operating complexity and resilience involve greater levels of automation, while greater strategic management and innovation require a new involved workforce making decisions that drive performance and objectives, no tasks. For successful Smart Meter projects in industry, Metering Services Operations are an integral part of the project planning, deployment and maintenance of the systems.

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